

REMARKS

The Official Action mailed April 17, 2007, has been received and its contents carefully noted. This response is filed within three months of the mailing date of the Official Action and therefore is believed to be timely without extension of time. Accordingly, the Applicant respectfully submits that this response is being timely filed.

The Applicant notes with appreciation the consideration of the Information Disclosure Statements filed on March 16, 2001; January 7, 2005; and March 23, 2006.

Claims 2-12 were pending in the present application prior to the above amendment. Independent claims 2, 6, and 11 have been amended to better recite the features of the present invention. Claims 2-12 remain pending in the present application, of which claims 2, 6, and 11 are independent. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 5 of the Official Action rejects claims 2, 3, 6, 8, and 11 as anticipated by U.S. Patent No. 6,081,228 to Leimer. The Applicant respectfully submits that an anticipation rejection cannot be maintained against the independent claims of the present application, as amended. As stated in MPEP § 2131, to establish an anticipation rejection, each and every element as set forth in the claim must be described either expressly or inherently in a single prior art reference. Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987).

The Applicant respectfully submits that an anticipation rejection cannot be maintained against the independent claims of the present application, as amended. Applicant has amended each of the independent claims to clearly define the constitution of the present invention and to fully distinguish the present invention from the cited prior art. While the Applicant does not necessarily agree that the Official Action has established a *prima facie* case of anticipation, the claims have been amended for the purpose of clarifying the uniqueness of the present invention.

Each of the amended independent claims clearly recites the following technical features: "if the detected decoding error rate is equal to or less than a second predetermined threshold, the phase noise characteristics are decided to be higher quality, while if the detected decoding error rate exceeds the second predetermined threshold, the phase noise characteristics are decided to be lower quality" and "the means for selecting and switching a carrier regenerative loop characteristic operates so that (i) if it is decided by the decision means that the phase noise characteristics are higher quality, a carrier regenerative loop characteristic corresponding to a critical CNR by a phase noise (e.g., a graph a in Fig. 5) having a rapid variation property is selected, and (ii) if it is decided by the decision means that the phase noise characteristics are lower quality, a carrier regenerative loop characteristic corresponding to a critical CNR by a phase noise (e.g., a graph c in Fig. 5) having a gentle variation property is selected."

The above features are unique to the present invention, which have been incorporated, into each independent claim through the above amendments, and are supported by at least the descriptions with reference to Figure 2 and Figure 5 in the specification, and by at least page 13, line 14 to page 14, line 25 in the specification, which discloses:

--In the step S6, when the detected bit error rate is recognized to be better than a predetermined bit error rate for the received CNR, that is, for example, when the bit error rate is recognized to be equal to or less than 6.8×10^{-3} , the phase noise characteristics of the ODU connected to the receiver are determined to be good so that the filter factor of the loop filter 9 is set to the characteristic where the characteristics of the carrier regenerative loop correspond to the characteristic b of Figure 5. Then the 8PSK-modulating signal is burst-received again and its bit error rate is detected (step S7) and the detected bit error rate is checked to see if it is better than the predetermined bit error rate (step S8). This is the case where the characteristics of the carrier regenerative loop are set to the characteristic b and the detected bit error rate is checked to see if it is, for example, equal to or less than 5.5×10^{-3} .

In the step S6, when the detected bit rate is recognized not to be better than the predetermined bit error rate for the received CNR, that is, for example, when the detected bit error rate is recognized to be more than 6.8×10^{-3} , the phase noise characteristics of the ODU connected to the receiver are determined not to be good so that the burst reception mode is released while the characteristics of the carrier regenerative loop remain set to the characteristic c of Figure 5, thereby executing a normal reception mode to start the normal reception (step S13).

In the step S8, when the detected bit error rate is recognized to be better than the predetermined bit error rate for the received CNR, that is, when the detected bit error rate is recognized to be equal to or less than 5.5×10^{-3} , the phase noise characteristics of the ODU connected to the receiver are determined to be fairly good so that the filter factor of the loop filter 9 is set to the characteristic where the characteristics of the carrier regenerative loop correspond to the characteristic a of Figure 5. Then the 8PSK-modulating signal is burst-received again and its bit error rate is detected (step S9) and the detected bit error rate is checked to see if it is better than the predetermined bit error rate (step S 10). This is the case where the characteristics of the carrier regenerative loop are set to the characteristic a and the detected bit error rate is checked to see if it is, for example, equal to or less than 4.5×10^{-3} . [Emphasis added.]

The present invention is particularly unique in estimating inherent phase-noise characteristics of a local oscillator contained in a down-converter in an outdoor unit (i.e., an antenna plus a down converter) on the basis of the measured BER when the measured CNR has a specific value.

The technical idea of the present invention is based on the discovery of the phenomenon that the relationship between the reception CNR and the BER of the digital signal (when burst waves are received) varies depending on the inherent phase noise characteristic of the local oscillator in the outdoor unit. The present invention provides a way to properly estimate the inherent phase-noise characteristic of the local oscillator in the outdoor unit on the basis of (i) the known relationship (i.e., foresight information, which has been measured beforehand, among the reception CNR, the BER and the inherent phase-noise level of the local oscillator, and (ii) the CNR and the BER which are actually observed when operating the receiver.

According to the present invention, even if it is difficult to directly measure the inherent phase-noise characteristic of the local oscillator, the inherent phase-noise characteristic of the local oscillator can be estimated to practically permissible accuracy on the basis of the detection of both the CNR and the BER upon reception. Therefore, this brings the specific technical advantage that it is possible to automatically establish the carrier regenerative loop characteristic suitable to the property of the outdoor unit connected to the receiver.

In the present invention, first of all, it is detected whether a received CNR exceeds a first predetermined threshold value (e.g., 15dB), and when the received CNR exceeds the first predetermined threshold value, the bit error rate (BER) is further detected. Thus, it is decided whether a value of the BER (when the measured CNR exceeds the first predetermined) is more or less than a second predetermined threshold value (e.g., 5.5×10^{-3}), and on the basis of this decision result for the BER, it is further estimated and decided whether the phase noise characteristics of the local oscillator contained in the down-converter are higher quality or lower quality. And, if the phase noise characteristics of the local oscillator are decided to be higher quality, a carrier regenerative loop characteristic is set at a characteristic a (shown in Figure 5), and otherwise the carrier regenerative loop characteristic is set at a characteristic b or c (shown in Figure 5).

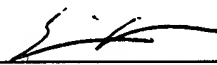
The above unique feature of the present invention is neither taught nor suggested by Leimer and Miya, either taken alone or in combination. The receiver of Leimer comprises the component "Common Mode Phase Estimator," to estimate the phase noise. However, in Leimer, the estimate of the phase noise is made by tracing the phase of the received signal, which is essentially different from the estimating technique of the present invention (which does not use the received signal at all). Moreover, the present invention provides an arrangement in which the carrier regenerative loop characteristic is changed whereas Leimer aims to remove the useless phase noise and does not disclose or suggest that the carrier regenerative loop

characteristic is changed. The Official Action fails to address the claimed feature that the carrier regenerative loop characteristic is changed. Since Leimer does not teach all the elements of the independent claims, either explicitly or inherently, an anticipation rejection cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 102 are in order and respectfully requested.

Paragraph 6 of the Official Action rejects claims 4, 5, 7, 9, 10, and 12 as obvious based on the combination of Leimer and U.S. Patent No. 5,572,516 to Miya. Miya does not cure the deficiencies noted above in Leimer. Miya is cited to teach that it is known to transmit PSK modulated signals in GPS systems. Miya, however, does not teach or suggest that the carrier regenerative loop characteristic is changed as changed and fore at least this reasons, the obviousness rejection of claims 4, 5, 7, 9, 10 and 12 is believed to be overcome. Favorable reconsideration is requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully submitted,



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